NSPM CORRECTIVE ACTION EFFECTIVENESS REVIEW

AR Identifier: *EFR*	**EFR Assesses:** ☒ **RCE Corrective Action** ☐ **ACE Corrective Action** ☐ **Other**

Root Cause or Problem Statement Addressed by the Activity under review: *Leakage through the anchor bolts of the internals stands and RCC Change Fixture*

Activity Identifier **Being Reviewed:** *CAPR 1160372-03*	**Activity Description:** *Develop and implement repairs that permanently eliminate leakage through the anchor bolt penetrations of the Unit 1 refueling pool.*

Method of Analysis (check all that apply):

☒ Field Verification	☒ Observation	☐ Records Review (list records)
☐ Audit	☐ Surveillance	☐ Self-Assessment (Focused/SnapShot)
☐ Interviews	☐ Testing	☐ External Assessment
☐ Formal Survey	☐ Informal Survey	☐ Other (list)

Attribute and Measure of Success: *Monitor and document the absence of Unit 1 leakage in typical areas including the Sump B and Regen Hx room for the first pool flood after repair in 1R26. Continued leakage would indicate either the wrong root cause of ineffective repairs.*

Analysis: *Areas where leakage had previously been revealed were routinely inspected during 1R26. No leakage was observed until 10/5/2009, when leakage of 7-8 drips per minute was observed coming out of the ceiling of the Regenerative Heat Exchanger Room. CAP 01201071 was initiated for the deficiency. The leakage was observed approximately 14 days after flooding of the refueling cavity. Results of inspection of other areas that had leaked in previous outages, but did not show leakage in 1R26 are as follows:*

- *Sump B grout (sump B has been wetted from RHR suction pipes, no leakage through the grout). Grout removal in sump B near the B suction pipe earlier in the outage was dry with no degradation of the containment vessel, rebar, or grout.*
- *The corner of containment 715' level near the 12 accumulator (caulk has sheen, but does not appear to be water).*
- *NIS penetrations (old white stains)*
- *The corner of containment near the 11 accumulator (dry white stain)*
- *Floor near the reactor coolant drain tank (dry white stain)*

The Regenerative Heat Exchanger Room ceiling was examined about 1 hour after draining to the 240" level in the refueling l. The wetness was still present, but the dripping had stopped. This supports that the observed leakage may be coming from the RCC change fixture guide tube supports. This is based on two factors. First, leakage essentially stopped when the pool level was lowered below one, and possibly two, of the four wall supports. Second, the wall anchors are essentially the same construction as the floor anchors in which a "J" bolt penetrates the refueling cavity liner and is sealed by a buried seal weld that cannot be inspected.
Repairs performed at the beginning of 1R26 are not suspected as being the source of the leakage. All welding performed was visually and dye penetrant examined to confirm the integrity of the welds.

Conclusion: ***The corrective action was not effective.*** *Although leakage was decreased from the prior reported rate of 1-2 gallons per hour (without caulking or instacote) to a calculated rate of 1 gallon per day, leakage has not been eliminated. The subject CAPR has been extended to the end of 1R27 to allow for completion of repairs to confirmed leakage locations. Extension of the CAPR was approved by PARB on 10/14/2009.*

Actions from CAP 01201071 are tracking completion of an impact assessment of the leakage (update of prior evaluation), revision of RCE 01160372, and identification of the additional inspections to be performed during 1R26 to identify the remaining source(s) of refueling cavity leakage.

- The Corrective Action taken meets the intent of the original Corrective Action assignment and approved changes, and the schedule for planned actions supports prevention of event recurrence:

  ☐ Yes ☒ No

  Cavity leakage was expected to be eliminated during 1R26. Due to leakage observed, additional repairs and the associated validation of leakage elimination will not occur until 1R27 (Spring 2011.) Recommend revision of RCE 01160372, and performance of additional inspections during 1R26 to identify the remaining source(s) of refueling cavity leakage. Results of these actions should be incorporated into repair plans for Unit 2 during 2R26.

- The Corrective Action taken has been adequately challenged:

  ☒ Yes ☐ No *[If No, make recommendations to correct.]*

- The Corrective Action taken has effectively prevented reasonable recurrence of the problem and similar occurrences:

  ☐ Yes ☒ No

  Cavity leakage was expected to be eliminated during 1R26. Due to leakage observed, additional repairs and the associated validation of leakage elimination will not occur until 1R27 (Spring 2011.) Recommend revision of RCE 01160372, and performance of additional inspections during 1R26 to identify the remaining source(s) of refueling cavity leakage. Results of these actions should be incorporated into repair plans for Unit 2 during 2R26.

- The Corrective Action taken has not resulted in a negative impact to plant operation, programs or equipment:

  ☐ Yes ☒ No

  Cavity leakage is a nuclear safety concern due to the potential for degradation of concrete, rebar and the containment vessel. Recommend that an impact assessment be performed of the additional degradation that could have occurred as a result of continued leakage. Completed per CAP 01201071, action item -02.

Note – If any of the above questions are "No" – generate a new CAP for resolution. CAP 01201071

CAPs written as a result of this review: ☒ Yes ☐ No

Initiated CAP Identifiers (when applicable): *CAP 01201071*

Additional Effectiveness Review Required? ☒ Yes ☐ No *EFR 01160372-23 generated to be completed following 1R27*

Does Effectiveness Review require PARB Review? ☒ Yes ☐ No *[Yes, for all CAPR related EFRs]*

Performed By: Steven Skoyen 10/15/2009 **Approved By:**

References: Corrective Action Effectiveness Review Manual
Form retained in accordance with record retention schedule identified in FP-G-RM-01.